



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VP-438

Presentation Switcher/Scaler

P/N: 2900-000642 Rev 5

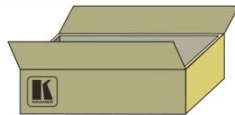


VP-438 Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ☒ **VP-438** Presentation Switcher/Scaler
- ☒ 1 Power cord
- ☒ 1 Set of rack "ears"
- ☒ 4 Rubber feet
- ☒ 1 Quick Start sheet
- ☒ Kramer RC-IR3 Infrared Remote Control Transmitter with batteries



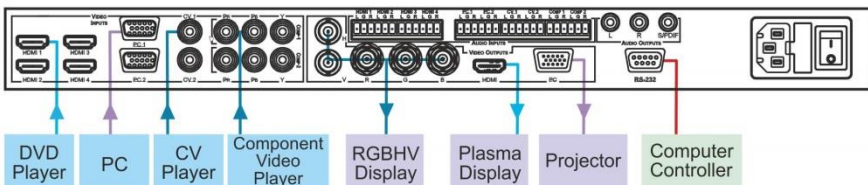
Save the original box and packaging materials in case you need to return your **VP-438** for service.

Step 2: Install the VP-438

Mount the **VP-438** in a rack (using the included rack "ears") or attach the rubber feet and place on a table.

Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **VP-438**.



Always use Kramer high-performance cables for connecting AV equipment to the **VP-438**.

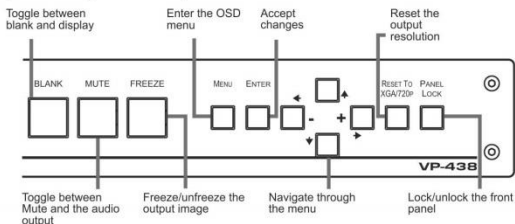
Step 4: Connect the power

Connect the power cord to the **VP-438** and plug it into the mains electricity.



Step 5: Operate the VP-438

Select the input using the front panel or the remote control.



Contents

1	Introduction	1
2	Getting Started	2
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	3
2.3	Recycling Kramer Products	3
3	Overview	4
3.1	Defining the VP-438 Presentation Switcher/Scaler	5
4	Installing in a Rack	8
5	Connecting the VP-438	9
6	Controlling the VP-438	11
6.1	Controlling via the Front Panel Buttons	11
6.2	Using the OSD Menu	11
6.3	Connecting to VP-438 via RS-232	14
6.4	Controlling via the Infrared Remote Control Transmitter	15
7	Technical Specifications	16
7.1	Input Resolutions	17
8	RS-232 Communication Protocol	18

Figures

Figure 1: VP-438 Presentation Switcher/Scaler Front Panel	6
Figure 2: VP-438 Presentation Switcher/Scaler Rear Panel	7
Figure 3: Connecting the VP-438 Presentation Switcher/Scaler	10
Figure 4: Infrared Remote Control Transmitter	15

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer **VP-438** *Presentation Switcher/Scaler*, which is ideal for the following typical applications:

- Projection systems in conference rooms, boardrooms, auditoriums, hotels and churches, production studios, rental and staging
- Home theater up-scaling

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual



Go to <http://www.kramerelectronics.com> to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VP-438** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions



Caution: There are no operator serviceable parts inside the unit

Warning: Use only the power cord that is supplied with the unit

Warning: Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at <http://www.kramerelectronics.com/support/recycling/>.

3 Overview

The Kramer **VP-438** is a high-quality presentation switcher and scaler. It accepts one of 10 inputs: four HDMI signals, two computer graphics signals on 15-pin HD connectors, two composite video signals on RCA connectors and two component video signals (also known as Y, Pb, Pr, Y, Cb, Cr and YUV; compatible with both SD and HD component) on RCA connectors. It scales the video, embeds the audio, and outputs the signal to the HDMI output, as well as to a computer graphics output and an RGBHV video output with digital audio and analog stereo audio outputs.

The **VP-438** Presentation Switcher/Scaler:

- Is HDTV compatible and the resolution can be up- or down-scaled
- Is HDCP compliant, the HDCP (High Definition Content Protection) license agreement allows copy-protected data on the HDMI input to pass only to the HDMI output
- Output signal is available in three formats: 1 HDMI and 2 RGBHV (on 5 BNC connectors, and one 15-pin HD connector)
- Has analog audio inputs, which include volume control, and digital (S/PDIF) and analog stereo audio outputs
- Automatically detects and selects the audio source for the HDMI input. Default selection is HDMI – if this is not present, then the machine uses the audio from the analog input
- Comes with an On-Screen Display (OSD) for easy setup and adjustment, accessible via the IR remote control and via the front-panel buttons
- Has a non-volatile memory that retains the last settings used
- Supports firmware upgrade via RS-232

Control your **VP-438**:

- Directly, via the front panel push buttons
- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Remotely, from the infrared remote control transmitter

The **VP-438** is housed in a 19" 1U rack mountable enclosure, with rack "ears" included, and is fed from a 100-240V AC universal switching power supply.

3.1 Defining the VP-438 Presentation Switcher/Scaler

This section defines the **VP-438**.

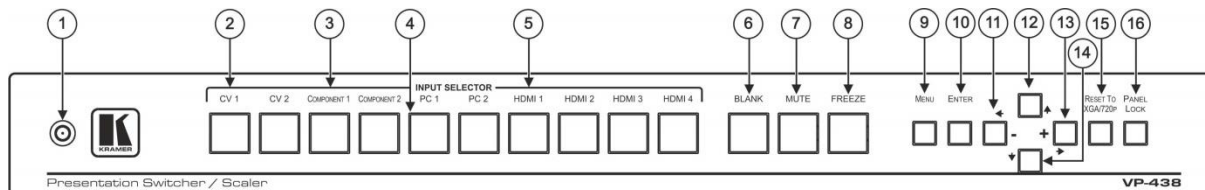


Figure 1: VP-438 Presentation Switcher/Scaler Front Panel

#	Feature	Function
1	IR Receiver	Receives signals from the remote control transmitter
2	CV	Press to select the composite video input (from 1 to 2)
3	COMPONENT	Press to select the component video input (from 1 to 2)
4	PC	Press to select the computer graphics input (from 1 to 2)
5	HDMI	Press to select the HDMI input (from 1 to 4)
6	BLANK Button	Press to toggle between a blank screen and the display (can be programmed to follow MUTE, see Section 6.2.3)
7	MUTE Button	Press to toggle between muting (blocking out the sound) and enabling the audio output
8	FREEZE Button	Press to freeze/unfreeze the output video image
9	MENU Button	Displays the OSD menu (see Section 6.2)
10	ENTER Button	Press to accept changes and change the SETUP parameters (see Section 6.2)
11	- ◀ Button	Press to decrease numerical values or select from several definitions. When not working in the OSD—press to reduce volume
12	▶ Button	Press to move up the menu list
13	+ ▶ Button	Press to increase numerical values or select from several definitions. When not working in the OSD—press to increase volume
14	◀ Button	Press to move down the menu list
15	RESET TO XGA/720p Button	Press and hold to reset the video resolution to XGA or 720p (press and hold for about 2 seconds to reset to XGA; or press and hold for about 5 seconds to reset to 720p)
16	PANEL LOCK Button	Press and hold for about 2 seconds to lock/unlock the front panel buttons

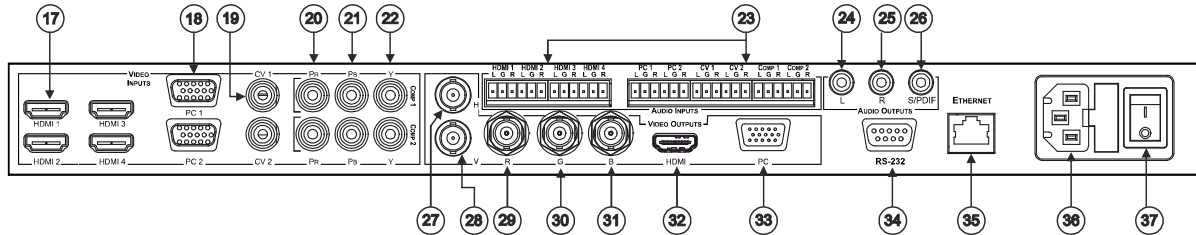


Figure 2: VP-438 Presentation Switcher/Scaler Rear Panel

#	Feature		Function
17	VIDEO INPUTS	HDMI Connector	Connect to the HDMI source (from 1 to 4)
18		PC 15-pin HD Connector	Connect to the computer graphics source (from 1 to 2)
19		CV RCA Connector	Connect to the composite video source (from 1 to 2)
20		PR RCA Connector	Connect to the component video source (from 1 to 2) For component video, connect all three connectors: Y, Pr, Pb (also known as YUV)
21		Pb RCA Connector	
22		Y RCA Connector	
23	AUDIO INPUTS Unbalanced Stereo Terminal Block Connectors	HDMI	Connect to the analog audio HDMI source (from 1 to 4)
		PC	Connect to the analog audio computer graphics source (from 1 to 2)
		CV	Connect to the analog audio composite video source (from 1 to 2)
		COMP	Connect to the analog audio component video source (from 1 to 2)
24	AUDIO OUTPUTS RCA Connectors	L	Connect to the left stereo analog audio acceptor
25		R	Connect to the right stereo analog audio acceptor
26		S/PDIF	Connect to a digital audio acceptor
27	VIDEO OUTPUTS	H BNC Connector	Connect to the RGBHV video acceptor
28		V BNC Connector	
29		R BNC Connector	
30		G BNC Connector	
31		B BNC Connector	
32		HDMI Connector	Connect to the HDMI acceptor
33		PC 15-pin HD Connector	Connect to a VGA acceptor
34	RS-232 9-pin D-sub Port		Connect to the PC or the remote controller
35	ETHERNET RJ-45 Connector		Connect to a network
36	Power Connector with Fuse		AC connector, enabling power supply to the unit
37	Power Switch		Switch for turning the unit ON or OFF

4 Installing in a Rack

This section provides instructions for rack mounting the unit.

Before installing in a rack, be sure that the environment is within the recommended range:

OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing



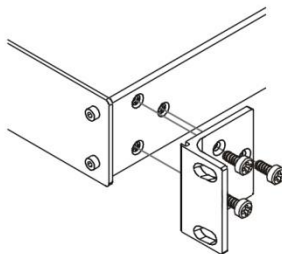
CAUTION!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from our Web site

5 Connecting the VP-438



Always switch off the power to each device before connecting it to your **VP-438**. After connecting your **VP-438**, connect its power and then switch on the power to each device.

To connect your **VP-438**, as illustrated in the example in [Figure 3](#), do the following:

You do not have to connect all the inputs and outputs, connect only those that are required.

1. Connect an HDMI source (for example, a DVD player) to each of the HDMI VIDEO INPUT connectors (from 1 to 4).
Alternatively, you can connect the DVI connector on the DVD player to the HDMI connector on the VP-438 via a DVI-HDMI adapter. When using this adapter, you can connect the audio signal via the terminal block connector.
2. Connect a computer graphics source to the PC 1 15-pin HD VIDEO INPUT connector.
3. Connect a composite video source (for example, a composite video player) to both CV VIDEO INPUT RCA connectors.
4. Connect a component video source (for example, a component video player) to the COMP 1 PR, PB and Y, VIDEO INPUT RCA connectors.
5. Connect the audio input signals to the AUDIO INPUT terminal block connectors, as required (not shown in [Figure 3](#)).
6. Connect the RGBHV VIDEO OUTPUT BNC connectors to an RGBHV acceptor (for example, an RGBHV display).
7. Connect the HDMI VIDEO OUTPUT connector to an HDMI acceptor (for example, a plasma display).
8. Connect the VGA VIDEO OUTPUT 15-pin HD connector to a VGA acceptor (for example, a projector).
9. Connect the audio output signals to the AUDIO OUTPUTS stereo analog audio acceptor and/or the digital audio acceptor, as required (not shown in [Figure 3](#)).
10. Connect the power cord (not shown in [Figure 3](#)).

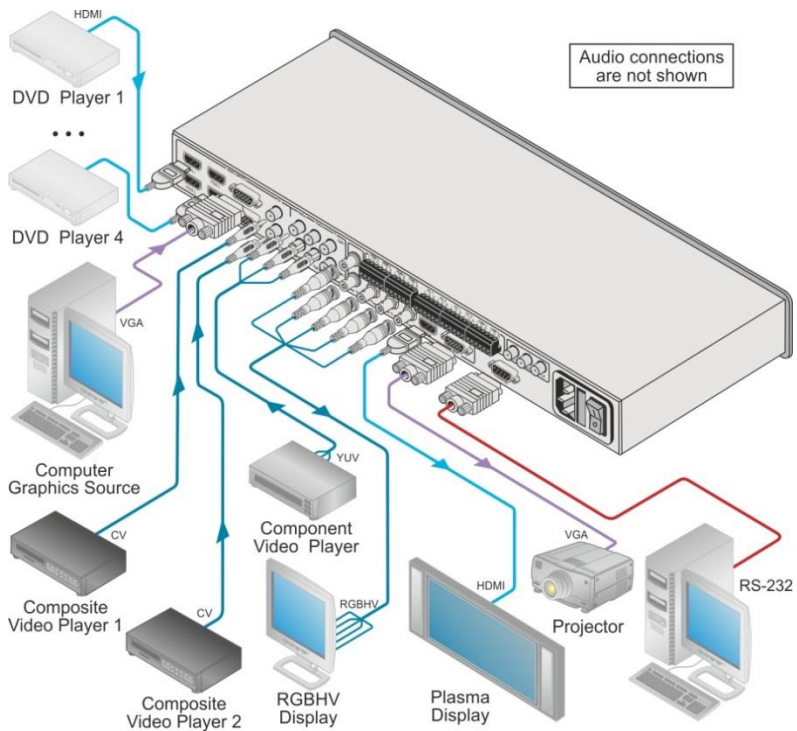


Figure 3: Connecting the VP-438 Presentation Switcher/Scaler

6 Controlling the VP-438

The **VP-438** can be controlled via:

- The front panel buttons (see [Section 6.1](#))
- The OSD menu (see [Section 6.2](#))
- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller (see [Section 6.3](#))
- The infrared remote control transmitter (see [Section 6.4](#))

6.1 Controlling via the Front Panel Buttons

The **VP-438** includes the following front panel buttons:

- Input selector buttons for selecting the required input: CV (1 and 2), COMPONENT (1 and 2), PC (1 and 2) or HDMI (1 to 4)
- BLANK, MUTE and FREEZE buttons
- MENU, ENTER, and up, down, left and right arrow buttons
- RESET TO XGA/720p and PANEL LOCK buttons

6.2 Using the OSD Menu

The control buttons let you control the **VP-438** via the OSD menu.

Press the:

- MENU button to enter the menu (The default timeout is set to 10 seconds)
- ENTER button to accept changes and to change the menu settings
- Arrow buttons to move through the OSD menu, which is displayed on the video output

On the OSD menu, select EXIT to exit the menu.

6.2.1 The MAIN MENU

The following table defines the MAIN MENU features and functions.

Note: The range and default values vary according to the input signal.

Mode	Function			
CONTRAST	Set the contrast			
BRIGHTNESS	Set the brightness			
FINETUNE	(see Section 6.2.2)			
COLOR	Set the red, green and blue shades			
SIZE	Select the size of the display: FULL, OVERSCAN, UNDER1, UNDER2, LETTER BOX, PANSKAN, BEST FIT (default, FULL)			
SOURCE	Select the source: (default VGA)			
	Appears as:	Source input	Appears as:	Source input
	CV1	CV 1	PC2	VGA 2
	CV2	CV 2	HDMI1	HDMI 1
	YPBPR1	COMP 1	HDMI2	HDMI 2
	YPBPR2	COMP 2	HDMI3	HDMI 3
	PC1	VGA 1	HDMI4	HDMI 4
OUTPUT	Select the output resolution from the menu (default NATIVE):			
	Appears as:	Output resolution:	Appears as:	Output resolution:
	480I	480i	1080P59	1080p@59.94Hz
	480P	480p	NATIVE Selects the output resolution from the EDID of the connected HDMI monitor	
	720P60	720p @50Hz	VGA	640x480
	1080I60	1080i @60Hz	SVGA	800x600
	1080P60	1080p @60Hz	XGA	1024x768
	576I	576i	SXGA	1280x1024
	576P	576p	UXGA	1600x1200
	720P50	720p @50Hz	WXGA	1366x768
	1080I50	1080i @50Hz	WSXGA	1680x1050
	1080P50	1080p @50Hz	WUXGA	1920x1200
	480I59	480i@59.94Hz	1280x800	1280x800
	480P59	480p@59.94 Hz	WXGA+	1440x900
	720P59	720p@59.94Hz	SXGA+	1400x1050
	1080I59	1080i@59.94Hz	1600x900	1600x900
AUDIO	See Section 6.2.3			
OSD	Set the OSD parameters: H POSITION, V POSITION, TIMER, BACKGROUND and DISPLAY (see Section 6.2.4)			
HDCP ON INPUT	Select the HDCP option for the HDMI input: either ON (the default) or OFF. Setting HDCP support to enabled (ON) on the HDMI input allows the source to transmit a non-HDCP signal if required (for example, when working with a Mac computer)			

Mode	Function
HDCP ON OUTPUT	Select FOLLOW INPUT or FOLLOW OUTPUT to define whether the HDCP will follow the input or the output When FOLLOW INPUT is selected, it changes its HDCP output setting (for the HDMI output) according to the HDCP of the input. This option is recommended when the HDMI output is connected to a splitter/switcher When FOLLOW OUTPUT is selected, the scaler matches its HDCP output to the HDCP setting of the HDMI acceptor to which it is connected
FACTORY RESET	Resets to the default parameters (resolution is set to XGA or 720p) If you cannot see the display after factory reset, use the front panel Res. button to set the correct resolution: press continuously for 2 seconds to reset to XGA, or continuously for 5 seconds to reset to 720p
INFORMATION	Displays the source, the input resolution, the output resolution and the software version
AUTO SYNC OFF	Turn the auto sync ON/OFF. When ON, a short period after not detecting a valid video signal on the selected input, the unit will disable the H and V syncs on the analog outputs until a valid input is again detected or any keypad button is pressed
EXIT	Select to exit the menu

6.2.2 The FINETUNE Menu

The following table defines the FINETUNE menu:

Input Signal	Parameter	Function
CV, COMPONENT	HUE	Set the color hue
	SATURATION	Set the color saturation
	SHARPNESS	Set the sharpness of the picture
	NOISE REDUCTION	Select the noise reduction: OFF, HI, LOW and MID (middle)
	COLOR FILTER	Set to ON to enable color filtering May improve the output image for certain graphic cards where color fringing is seen
VGA	PHASE	Set the clock phase
	CLOCK	Set the clock frequency
	H-POSITION	Set the horizontal position of the picture
	V-POSITION	Set the vertical position of the picture
	AUTO TUNE	When set to ON, automatically centers the picture correctly on the screen every time the input is switched to VGA or when the input resolution changes Alternatively, you can auto adjust the image by pressing the ENTER button when not within the OSD menu
	COLOR FILTER	Set to ON to enable color filtering
HDMI	COLOR FILTER	Set to ON to enable color filtering

6.2.3 The AUDIO Menu

The following table defines the AUDIO menu.

Parameter	Function
OUTPUT VOLUME	Set the output volume (from 0 to 100) Not applicable for embedded HDMI audio inputs
INPUT VOLUME	Set the input volume (from 0 to 100)
DELAY	Select the audio delay time: OFF, 40ms, 110ms and 150ms
SOUND	Select the sound options: ON, MUTE
MUTE FOLLOWS	Select the action that will be followed by mute: INDEPENDENT, FREEZE, BLANK, FREEZE/BLANK INDEPENDENT means that the audio muting is independent of the FREEZE and BLANK functions FREEZE/BLANK means that when you FREEZE or BLANK the video, then the audio will be muted (the MUTE function follows the FREEZE and the BLANK functions)
HDMI AUDIO IN Enabled only when one of the HDMI inputs is selected	Select AUTOMATIC (In this case, the embedded audio on the HDMI input is selected for an HDMI signal, or the analog audio input is selected if the input is not HDMI (for example, for a DVI input signal), EMBEDDED (In this case, the embedded audio in the HDMI signal is selected) or ANALOG (In this case, the analog audio input is selected)

6.2.4 The OSD Menu

The following table defines the OSD menu.

Parameter	Function
H POSITION	Set the horizontal position of the OSD (from 0 to 100)
V POSITION	Set the vertical position of the OSD (from 0 to 100)
TIMER	Set the timeout period in seconds (from 5 to 100)
BACKGROUND	Set the OSD background between 0 (solid black) and 8 (transparent)
DISPLAY	Select the information shown on the screen during operation: ON - the information is shown permanently OFF - the information is not shown INFO - the information is shown for a few seconds

6.3 Connecting to VP-438 via RS-232

You can connect to the **VP-438** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect to the **VP-438** via RS-232, connect the RS-232 9-pin D-sub rear panel port on the **VP-438** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC.

6.4 Controlling via the Infrared Remote Control Transmitter

You can control the **VP-438** from the infrared remote control transmitter, as defined in [Figure 4](#):

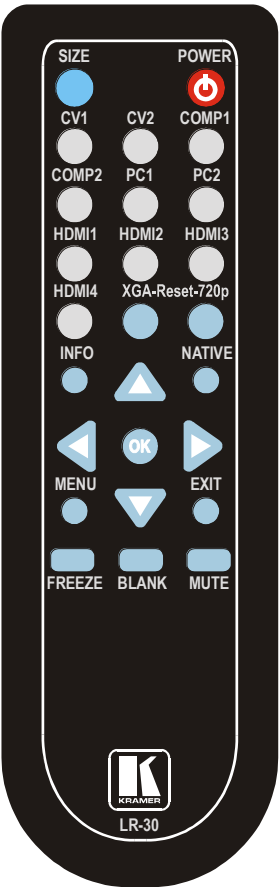


Figure 4: Infrared Remote Control Transmitter

Keys	Function
SIZE	Set the size of the image displayed
POWER	Turn the VP-438 ON or OFF OFF in this case means that the unit is in standby mode
CV1	Select the composite video 1 input
CV2	Select the composite video 2 input
COMP1	Select the component video 1 input
COMP2	Select the component video 2 input
PC1	Select the UXGA 1 input
PC2	Select the UXGA 2 input
HDMI1	Select the HDMI 1 input
HDMI2	Select the HDMI 2 input
HDMI3	Select the HDMI 3 input
HDMI4	Select the HDMI 4 input
XGA Reset	Reset the resolution to XGA
720p Reset	Reset the resolution to 720p
INFO	Displays the selected input, the input and output resolutions and the firmware versions on the OSD
NATIVE	Select the output resolution via the EDID of the connected HDMI monitor
	Four navigation keys (Left and right arrow keys also function as output volume control)
OK	Press to accept changes
MENU	Enter the OSD menu
EXIT	EXIT the menu
FREEZE	Freeze/unfreeze the output video image
BLANK	Toggle between a blank screen and the display
MUTE	Toggle between muting (blocking out the sound) and enabling the audio output

7 Technical Specifications

INPUTS:	4 HDMI connectors (HDMI, HDCP version 1.1) 2 VGA on a 15-pin HD connector 2 composite video on an RCA connector 2 component video each on 3 RCA connectors Unbalanced stereo audio on 10 3-pin terminal block connectors
OUTPUT:	1 RGBHV on 5 BNC connectors 1 HDMI connector (HDMI, HDCP version 1.1) 1 VGA (RGBHV) on a 15-pin HD connector 1 S/PDIF on an RCA connector 1 analog stereo audio on 2 RCA connectors
H FREQUENCY:	15.63-90kHz
V FREQUENCY:	50-100Hz
RGB SYNCs:	H and V TTL separated syncs
RGB LEVEL:	1.2Vpp max, 75Ω load
XGA OUT LEVEL:	1.2Vpp max, 75Ω load
S/PDIF OUT LEVEL:	0.55Vpp constant
OUTPUT RESOLUTIONS:	480i, 480p, 720p @50Hz, 1080i @60Hz, 1080p @60Hz, 576i, 576p, 720p @50Hz, 1080i @50Hz, 1080p @50Hz, 480i@59.94Hz, 480p@59.94 Hz, 720p@59.94Hz, 1080i@59.94Hz, 1080p@59.94Hz, 640x480, 800x600, 1024x768, 1280x1024, 1600x1200, 1366x768, 1680x1050, 1920x1200, 1280x800, 1440x900, 1400x1050, 1600x900
CONTROLS:	CV 1, CV 2, component 1, component 2, PC 1, PC 2, HDMI 1, HDMI 2, HDMI 3, HDMI 4, input selector buttons; blank, mute, freeze buttons; menu, enter, menu arrows, reset to XGA/720p, lock buttons, RS-232, IR
POWER CONSUMPTION:	100-240V AC, 25VA max.
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	100-240V AC, 25VA max.
WEIGHT:	19" x 7" x 1U (W, D, H) rack mountable
ACCESSORIES:	2.7kg (6lbs) approx
OPTIONS:	Power cord, rack ears, IR remote control
Specifications are subject to change without notice at http://www.kramerelectronics.com	

7.1 Input Resolutions

Resolution/Refresh Rate	CV	Y, Pb, Pr (Component)	PC	HDMI
480I/576I(NTSC/PAL)	Yes	Yes	No	Yes
480P/576P		Yes	No	Yes
720P @ (60/50)		Yes	No	Yes
1080I @ (60/50)		Yes	No	Yes
1080P @ (60/50)		Yes	No	Yes
1080P @ (24/25/30)		Yes	No	Yes
480P/576P-RGB			Yes	Yes
720P @ (60/50)-RGB			Yes	Yes
1080I @ (60/50)-RGB			No	Yes
1080P @ (60/50)-RGB			Yes	Yes
1080P @ (24/25/30)-RGB			No	Yes
VGA @ (60/67/72/75/85)			Yes	Yes
SVGA @ (56/60/72/75)			Yes	Yes
XGA @ (60/70/75)			Yes	Yes
SXGA @ (60/75)			Yes	Yes
1280X960			Yes	Yes
1600X900@60			Yes	Yes
UXGA@60 (1600X1200)			Yes	Yes
WXGA@60(1280x800)			Yes	Yes
WXGA+@60(1440x900)			Yes	Yes
WXGA@60(1366x768)			Yes	Yes
SXGA+ @60(1400x1050)			Yes	Yes
WSXGA@60(1680x1050)			Yes	Yes
WUXGA@60(1920x1200)			Yes	Yes
2K@50 (2048X1080)			Yes	Yes
2K@60 (2048X1080)			Yes	Yes

8 RS-232 Communication Protocol

The following is the COM port setting:

Baud Rate: 9600bps

Parity: None

Data Bits: 8 bits

Stop Bits: 1 bit

Set CTS Mode: Off

Set XON/XOFF: Off

The following table defines the symbol characters:

Symbol	Meaning
■	Space
[CR]	Carriage Return, ASCII code 0x0D
[LF]	Line Feed, ASCII code 0x0A

Set Command

Type in: Y■Control_Type■Function■Param[CR]

When sending a command, a blank character may precede [CR] if desired.

Reply: Z■Control_Type■Function■Param[CR][LF]

Get Command:

Type in: Y■Control_Type■Function[CR]

Reply: Z■Control_Type■Function■Param[CR][LF]

Example:

Example 1: set Brightness value to 32

Send: Y■1■16■32[CR]

Reply: Z■1■16■32[CR][LF]

Example 2: get current output resolution (2 = SVGA)

Send: Y■4■21[CR]

Reply: Z■4■21■2[CR][LF]

The following table defines the RS-232 Protocol:

Control Type	Function	Param (for Set)	Function Description	Comment
0	0	N/A	SIZE button on remote control	
0	1	N/A	POWER button on remote control	
0	2	N/A	FREEZE button on remote control	
0	3	N/A	480p button on remote control	
0	4	N/A	576p button on remote control	
0	5	N/A	720p button on remote control	
0	6	N/A	1080i button on remote control	
0	7	N/A	1080p button on remote control	
0	8	N/A	VGA button on remote control	
0	9	N/A	SVGA button on remote control	
0	10	N/A	XGA button on remote control	
0	11	N/A	SXGA button on remote control	
0	12	N/A	WXGA button on remote control	
0	13	N/A	UXGA button on remote control	
0	14	N/A	INFO button on remote control	
0	15	N/A	UP button on remote control	
0	16	N/A	NATIVE button on remote control	
0	17	N/A	LEFT button on remote control	
0	18	N/A	OK button on remote control	
0	19	N/A	RIGHT button on remote control	
0	20	N/A	MENU button on remote control	
0	21	N/A	DOWN button on remote control	
0	22	N/A	EXIT button on remote control	
0	23	N/A	CV1 button on remote control	
0	25	N/A	COMP1 button on remote control	
0	26	N/A	HDMI1 button on remote control	
0	27	N/A	HDMI2 button on remote control	
0	28	N/A	COMP2 button on remote control	
0	29	N/A	PC 1 button on remote control	
0	30	N/A	BLANK button on remote control	
0	31	N/A	MUTE button on remote control	
	33	N/A	Auto adjust	FW V6.12
0	34	N/A	CV2 button on remote control	
0	35	N/A	PC2 button on remote control	

Control Type	Function	Param (for Set)	Function Description	Comment
0	36	N/A	HDMI3 button on remote control	
0	37	N/A	HDMI4 button on remote control	
1: Set 2: Get	4	0~100	Color: Red	
1: Set 2: Get	5	0~100	Color: Green	
1: Set 2: Get	6	0~100	Color: Blue	
1: Set 2: Get	16	0~100	Brightness	
1: Set 2: Get	17	0~100	Contrast	
1: Set 2: Get	25	0~100	Hue	
1: Set 2: Get	26	0~100	Sharpness	
1: Set 2: Get	29	0~100	Saturation	
1: Set 2: Get	33	0~100	set an absolute volume for Output	
1: Set 2: Get	34	0~100	set an absolute volume for Input	
1: Set 2: Get	41	0~100	OSD Setting :H-Position	
1: Set 2: Get	42	0~100	OSD Setting: V-Position	
1: Set 2: Get	43	0~100	OSD Timeout	
1: Set 2: Get	44	0~8	OSD Background	
1: Set 2: Get	50	0~3	NR (Noise Reduction)	0: Off 1: Low 2: Mid 3: High
1: Set 2: Get	51	0~3	Audio delay	0: Off 1: 40ms 2: 110ms 3: 150ms
1: Set 2: Get	52	0~2	HDMI AUDIO IN	0 : AUTOMATIC 1 : EMBEDDED 2 : ANALOG
1: Set 2: Get	84	0~1	Auto Sync Off	0 : OFF (FW:6.14) 1 : ON
1: Set 2: Get	160	0~1	HDCP ON INPUT	0 : OFF 1 : ON
1: Set 2: Get	161	0~1	HDCP ON OUTPUT	0 : Follow input 1 : Follow output

Control Type	Function	Param (for Set)	Function Description	Comment
3: Set 4: Get	0	1~10	Select Input Source	1: CV1 2: CV2 3: COMP1 4: COMP2 5: PC1 6: PC2 7: HDMI1 8: HDMI2 9: HDMI3 10: HDMI4
3: Set 4: Get	1	0~6	Size	0: Full 1: Panscan 2: Overscan 3: Underscan1 4: Letterbox 5: Underscan2 6: BEST FIT
3: Set 4: Get	21	0~27	Output Resolution	0: Native 1: VGA 2: SVGA 3: XGA 4: SXGA 5: UXGA 6: 480i 7: 480p 8: 720p60 9: 1080i60 10: 1080p60 11: 576i 12: 576p 13: 720p50 14: 1080i50 15: 1080p50 16: WXGA 17: WSXGA 18: WUXGA 19: 1280x800 20: WXGA+ (1440X900) 21: SXGA+ (1400X1050) 22: 1600x900 F/W 1.32 23: 480i59 24: 480p59 25: 720p59 26: 1080i59 27: 1080p59
3: Set	23	1	Factory Reset	

Control Type	Function	Param (for Set)	Function Description	Comment
4: Get	24	0~24	INPUT Resolution (V1.41)	0: Un-known 1: VGA 2: SVGA 3: XGA 4: SXGA 5: UXGA 6: 480i 7: 480p 8: 720p60 9: 1080i60 10: 1080p60 11: 576i 12: 576p 13: 720p50 14: 1080i50 15: 1080p50 16: WXGA 17: WSXGA 18: WUXGA 19: 1280x800 20: WXGA+ (1440X900) 21: SXGA+ (1400X1050) 22: 1600X900 23: 2048X1080/50 24: 2048X1080/60
6: Set 7: Get	0	0~2	Power	0: Power Down 1: Power On 2: Reboot
6: Set 7: Get	1	0~1	Freeze	0: Off 1: On
6: Set 7: Get	2	0~1	Blank	0: Off 1: On
6: Set 7: Get	3	0~1	Mute	0: Off 1: On
6: Set 7: Get	4	0~1	Key lock	0: Off 1: On
6 : Set 7 : Get	140	0~1	Auto Tune (under fine tune)	0: Clear Auto Tune 1: Set Auto Tune

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW.

IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at www.kramerelectronics.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

Web site: www.kramerelectronics.com

E-mail: info@kramerel.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-000642



Rev: 5